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Lessons in Visual Signaling

BY
M. A. PALEN

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LESSONS IN VISUAL SIGNALING

By M. A. PALEN

Second Lieut. 12th Infantry

The Collegiate Press

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PREFACE

This book is not a treatise on visual signaling. Its aim is merely to furnish a system for training men in visual signaling. The system is the fruit of the author's efforts to train men in the company in the use of the flag kit furnished by the Signal Corps, and it is published with the hope that it may be of value to the service.

LESSONS IN WIGWAG SIGNALING

LESSON I.

The International Morse Code is announced in Circular 7, War Department, Office of the Chief Signal Officer, 1912, as the General Service Code of the Army to be used in visual signaling.

Learn the signals for the following letters of the alphabet:

A - - -

E -

I - -

M - - -

N - - -

S - - -

T -

Practice sending and receiving the following words:

an

ant

am

aim

at

sat

amen

eat

sin

innate

initiate

intent

item

main

maintain

same

man

tame

mania

mate

matin

time

tint

tennat

tenement

stain

states

satin

satiate

seem

sentiment

settee

mass

stamen

tennis

amass

1. In signaling with the flag there is one position and three motions. The initial position is with the flag staff held vertically in front of the body, with the butt of the staff at the height of the waist, and grasped with both hands; the signal man faces directly toward the person to whom he wishes to signal. A flag as a marker should be placed in the ground at the right of the sender to indicate to the distant station the direction the signal man is facing.

2. The first motion "dot" is to the right of the sender, starting from the vertical position and returning to it, making an arc of 90° .

3. The second motion, "dash," is a similar motion to the left of the sender.

4. The third motion, "front," is downward directly in front of the sender, and instantly returning to the vertical position.

5. To prevent the flag from becoming entangled on the staff and to display the whole surface of the flag to the receiver, describe, in making the motions "dot" and "dash," a horizontal, elongated 8.

6. A slight pause is made between each letter, but not between each motion.

7. The end of each word is followed by the motion "front."*

*Par. 26, Signal Book, U. S. Army, 1914.

The execution of the General Service Code with a beam of searchlight is similar to that of the flag; the first position being a vertical beam of light; the motions "dot," "dash" "front" are executed as with the flag.

With a torch or lantern, a footlight must be used as a point of reference to the different motions. The torch or lantern is swung out, upward to the right for "dot" and out, upward to the left for "dash," and raised vertically over the footlight for "front."

With the Heliograph or with flash signals, the first position is to turn a steady flash on the receiving station. Use a short flash for "dot" and a long steady flash for "dash."

With field buzzers use a short buzz for "dot" and a long buzz for "dash."

LESSON II.

Learn the signals for the following letters:

C - - - -	L - - - -	O - - - -
R - - - -	H - - - -	Y - - - -
Z - - - -		

Practice receiving and sending the following words:

can	come	anon
action	the	casemate

economy	eminence	enmity
enemy	entity	contention
has	homily	holiness
chain	consist	lattice
lentil	mantle	remonstrate
militia	ratchet	raly
senior	yeoman	zeal
zone	yell	entrench
ethical	shell	

1. The end of each word, abbreviation and conventional signal is followed by one "front."

2. The end of each sentence is followed by two "fronts."

3. The end of each message is followed by three "fronts."

4. If the sender discovers that he has made an error he signals "front" followed by the signal "AA" "Front," after which he begins the word in which the error occurred.

Practice sending and receiving the following sentences:

1. Reconnoiter all the hills to the east.
2. The artillery can cross the hills at Tracy.
3. They can see the trenches near the crest.
4. The trains cannot reach here till noon.
5. The enemy's artillery stores are at Atchison.
6. His intentions are to cross the Mosel at once.

7. It seems that the enemy's intention is to cross near Metz.

8. Retire as soon as the enemy crosses the Seille at Marly.

9. The horse artillery is to entrain at Manhattan.

10. The escort is to halt at Sells Station.

Before proceeding with a message when using the heliograph, the two stations in communication will adjust each on the flash of the other. When the adjustments are made the station called acknowledges the call and cuts off its flash, and the calling station proceeds with its message. If the receiving station sees that the sender's mirror is out of adjustment he will turn on a steady flash until answered by a steady flash. When the sender's mirror is adjusted the receiver will cut off his flash.

LESSON III.

Learn the signals for the following letters:

D --- F ---- G ----

K ---- U --- W ----

Practice sending and receiving the following words:

and	off	eguag
died	your	knik
taken	wedge	tfaw

wigwam	wagon	dleif
issuing	commander	redro
ground	column	noitacifitrof
gallery	guard	enizagam
general	messenger	tonk
khaki	swing	lway
windage	uniform	etinu
underwriter	siege	retsum
furlough	fuse	

1. Every signal station has a call letter, as Omaha, "O."

2. Every signalman has a personal call letter, as Jones, "Jo."

REGIMENTAL SIGNALMEN

For signalmen of companies or regimental signal detachments the following scheme of personal and station calls has been found to work very satisfactorily. Use the company or organization letter for the station call and the last letters of the alphabet for the personal calls. Thus the musicians would have the letters Y and Z, respectively, for their personal calls, Noncommissioned officers the next letters above Y and Z, and privates the letters above those of the noncommissioned officers. If musician Z answered a call he would acknowledge by giving the call AZ, which would mean that a musician of Company A answered. This scheme serves as both a

station and personal call. If he called B, it would mean B Company, or he might call BZ or BX, in this way signalmen know at once what company they are communicating with without having the information signaled each time.

3. To call a station, signal its call letter until acknowledged; if the call letter is not known, wave the flag until answered. With the heliograph signal a series of "dots" rapidly.

4. To acknowledge a call, signal "MM" front, followed by the call letter of the acknowledging station.

5. The conventional signal for "Acknowledgment" or "I understand," is "MM" "Front."

Practice sending and receiving the following sentences:

1. Delay the enemy and hold him west of the Missouri.

2. The enemy, strength two regiments of Infantry, are intrenching west of Taneytown road near Weikan house.

3. The head of the column is entering German-town; can see some artillery in the column.

4. The field trains will remain at St. Mary's church until further orders.

5. Cars and guard for your wounded ordered toward Lowemon.

6 This command will continue its march on Richmond tomorrow.

7. Send a mounted officer and eight mounted orderlies to destroy the ford across Salt Creek.

8. A Red force of all arms entered New Windsor last night.

9. The Signal Detachment will maintain lines of information along the line of march.

10. Entire red force at Hunterstown is retreating northward in disorder.

In order that signal men may learn from the beginning to depend on their flag for communication they should be assigned to stations far enough apart so that they cannot talk to one another. Two men will be assigned to each station, one will be designated as "reader" and the other as "operator." The "reader" calls off the words of the message to the "operator" and spells them out letter by letter, indicating by "front" when the last letter of the word is announced. He will observe the signals of the operator and call his attention to errors.

At the receiving station, the reader calls off each letter to the "recorder" as received without waiting for the whole word.

The conventional signal for "I understand" is the same with the heliograph as with the flag, except that "Front" is not signaled with the heliograph.

LESSON IV.

Learn the signals for the following letters:

B — — — — J — — — — P — — — —

Q — — — — V — — — — X — — — —

Practice receiving and sending the following words:

aqueduct	arabesque	etmaixorpa
archive	behoove	draveloub
buffalo	box	maj
jail	devise	pmuj
junction	map	lypitlum
occupation	ox	tcepxe
pack	palaver	redowp
pontoon	bridge	elitcejorp
prize	quart	tersamtrauq
quay	vanguard	yticolev
veterinarian	vent	xa
anxious	coxswain	evisolpxe

1. If the receiver for any reason, fails to get correctly what is signaled, he signals MMM "front," to stop the sending station, and then signals CC "front" A "front" followed by the last word correctly received. The sender will then begin sending with the word indicated by the receiver.

*Conventional Signals.**

Move a little to the left.....LL front
 Move a little to the right.....RR front

*Par. 26, Signal Book, U. S. Army, 1914.

Move a little uphill.....UU front
 Move a little downhill.....DD front
 Cease signaling.....MMM front
 Repeat after (word).....CC front A front

Practice sending and receiving the following sentences:

1. Reliable reports indicate that the enemy is advancing to Metz via the Chanville-Laquenexy road.

2. The enemy's force is estimated at two regiments of infantry, two batteries of artillery and one troop of cavalry.

3. Cavalry patrols of the enemy have been seen near Germantown and Two Taverns.

4. Our cavalry reports that a hostile force, estimated at one brigade, entered Gettysburg this morning via the Chambersburg road.

5. A spy reports that a hostile force of two squadrons and a machine-gun platoon camped at Beverly last night.

6. Refugees report that General Jose Velazquez Toral is in command of the Spanish forces at Santiago.

7. A spy reports that General Rorrejón has been ordered to cross the Rio Grande at La Palangana with his force.

8. A patrol reports a force of all arms approaching Manhattan from the west.

9. The bridge over the Missouri River at Leavenworth and Fort Leavenworth has been destroyed.

10. The Detachment of Signal Corps has established lines of information connecting all Brigade Headquarters with Division Headquarters.

LESSON V.

Review Exercise

Dot Letters:

E - I -- S --- H ----

Dash Letters:

T — M ——— O ———

Dot and dash letters of two elements:

A -- N —

Dot and dash letters of three elements:

D ---- G ——— K ——— R ---- U ----
W ———

Dot and dash letters of four elements:

B ---- C ----- F ----- J -----
P ----- Q ----- V ----- L -----
X ----- Y ----- Z -----

Practice receiving and sending the following words:

zero

unable

rorrer

seen

Erie

eciov

piece	choice	eltil
bottle	title	ecittal
alternate	lottery	noinipo
cottage	notice	elbail
vacancy	yankee	renoroc
colon	dollar	eci
yes	home	goh
controversy	eye	nori
here	there	wolley
zoölogy	completely	

Practice sending and receiving the following sentences:

1. A red force of two regiments of infantry and one battery of artillery going east entrained at New Oxford this morning.

2. A hostile force estimated at two regiments of infantry and two batteries of artillery crossed the Rock Island bridge this morning.

4. Reliable spies report that the bridge at Harvede-Grace is commanded by redoubts armed with siege artillery.

5. The enemy's line extends along the south bank of the Rappahannock, from Banks Ford to Port Royal.

6. It is reported that a red force of all arms crossed the Shenandoah River yesterday at Front Royal, moving north.

7. A red battalion of infantry advancing from Platte City encountered our forces at Lowemont and is now retiring via Millwood road.

8. The machine-gun commander reports that he has completed emplacements at Lowemont for his machine guns so as to cover the Millwood road.

9. Bridges over Salt Creek at Frenchman's and the railroad bridge at the mouth of Salt Creek have been destroyed by the enemy's cavalry.

10. Deserters from the enemy report that the Spanish are strongly entrenched on San Juan Hill and are prepared for a stubborn defense.

11. A hostile force of one division crossed the Susquehanna River yesterday afternoon at Harrisburg.

12. A red convoy of one hundred wagons and an escort of one battalion of infantry and a troop of cavalry entered Germantown this morning via the Baltimore turnpike.

LESSON VI.

Numerals:

1 - - - - - 2 - - - - - 3 - - - - -
 4 - - - - - 0 - - - - -

Practice receiving and sending the following:

100	2000	3000	4000
123	3423	4433	2211

333	3234	3004	3040
430	1234	4321	4320234

*Conventional Signals.**

Signature follows.....Sig front
 Error.....AA front
 Repeat last message.....CC front front
 Repeat last message.....CCC front front front

Practice sending and receiving the following sentences:

1. Works have been constructed at Roswell capable of holding 24,000 men and three days' rations.

2. Our cavalry defeated hostile cavalry 3 miles east of Leavenworth, capturing 3 prisoners. Our loss, 4 killed and 10 wounded.

3. 4th Brigade, Ind. Cavalry, 1st. F. A., Company of A Engineers, and 1st Ambulance Company will constitute the outpost on the east bank of the Missouri river.

4. Enemy has been completely routed and is retreating via the Emmetsburg road, pursued by the 4th Brigade and 2nd Field Artillery.

5. The two bridges over the Big Stranger at Easton have been damaged by fire and cannot be repaired before 11:30 A. M.

6. From Sentinel Hill I can see 2 troops of cavalry near the Flint place moving east along the Atchi-

*Par. 26, Signal Book, U. S. Army, 1914.

son Pike, followed by a large force near K, apparently the advance guard of a large force.

7. Enemy's advance guard is now approaching 144, his advance body is about 1200 yards south of that point.

8. Can see one battalion of red infantry in advance guard formation marching along 230-232 road; main body is about 1400 yards further south.

9. Enemy holds a line about 3000 yards long extending from Baldwin's place, west to hill south of 12.

10. Information gathered from deserters indicates that the enemy has about 12,000 effective men at Chattanooga.

LESSON VII.

Learn the signals for the following numerals:

5 ----- 6 ----- 7 ----- 8 -----
9 -----

Practice sending and receiving the following numbers:

1919	4884	5656	8948	7007
1234	4567	7890	9000	5555
6000	5000	9870	8000	5765
1000	20,000	500,000	500,500	1,000,022
1555	20,555	1,999,000	600,666	9,111,999
6001	11,611	999,666	600,900	1,000,900

The ciphers in 100, 1000 and 1,000,000 are sometimes mistaken for 1 and 9 in signaling and cause combination errors; to avoid this signal 1 hnd. for 100 1 tnd for 1000, and 1 myn for 1,000,000, 2 tnd for 2000.

In practice, numbers would be spelled out to avoid the possibility of errors.

*Conventional Signals.**

Signal faster.....FF front
 Another message.....AHR front
 Wait a moment.....- - - - front
 Message received.....R front

Abbreviations.†

The following abbreviations are in constant use and it is well for the signal men to become familiar with them.

af.	after	gn.	goodnight
b.	be	govt.	government
bf.	before	hr.	hear or here
bn.	been	hv.	have
cn.	can	msg.	message
Pd.	Paid	u.	you
r.	are	ur.	your
t.	you	w.	with
da.	day	wrd.	word

*Par. 26, Signal Book, U. S. Army, 1914.

†Par. 17, Id.

Abbreviations and conventional signals are used to save time. Practice receiving and sending the following sentences, translating the words into their proper abbreviations while signaling.

1. A hostile column, estimated at 5000 infantry, with artillery and cavalry, is advancing from the south, and another column of the same strength is advancing from the east.

2. The information received indicates that the enemy is advancing with a force of all arms, estimated at 3000, but that he cannot reach here before morning.

3. You are directed to hold your present position and check the enemy's advance until after dark.

4. All railroad tracks leading from Leavenworth for a distance of 15 miles have been destroyed.

5. The infantry will attach along the road they are now occupying, but will not advance till after the battery on the hill to the east has opened fire.

6. The support will assemble and join the column after it passes the line of outposts.

7. From my present position I can see a hostile advance guard of about a battalion near 224, main body is $1\frac{1}{2}$ mile in rear.

8. Have encountered hostile cavalry $1\frac{1}{2}$ miles north of Kickapoo; three regiments of red infantry

are reported to be in camp, 7 or 8 miles in rear of the cavalry.

9. It is estimated that 1,000,000 rounds of small arms ammunition have been captured from the enemy.

10. Word received from the advance cavalry today indicates that the enemy has been heavily reënforced and now has about 15,000 men in and about Leavenworth.

LESSON VIII.

Review *conventional signals* in Lessons IV, VI and VII. See also Part III, Circular 7, War Department, Office of the Chief Signal Officer, 1912.

To call a station—Signal its call letter until acknowledged. If the call letter is not known, wave the flag until acknowledged.

To acknowledge a call—Signal MM front, followed by the call letter of the acknowledging station, and the personal signal of the receiver.

To break or stop the signals from the sending station—Signal BK front.

To start the sending station—Signal CC front, followed by the last word correctly received.

To stop when the signaler has made an error—He signals "AA front," after which he begins the word in which the error occurred.

Figures, decimal points, and in ordinal numbers, the suffixes, "st," "d," "nd," and "th" are counted as one word and are followed by "front." The abbreviation "A. M." "P. M." and "per cent" are counted as one word.*

1. Captain Jones reports that his three troops of the 1st Cavalry will reach Germantown at 3:00 P. M.

2. A hostile column consisting of 2 regiments of infantry, 2 batteries of artillery and 3 troops of cavalry passed through Easten at 10:00 A. M.

3. Reports from spies indicate that about 20 per cent of the enemy's force taking part in yesterday's engagement were killed or wounded.

4. It is reported that 5 miles of track and 2 bridges of the Missouri Pacific R. R. were destroyed by the enemy on July 2nd.

5. The support, machine-gun platoon and 2 troops of cavalry under Major Williams will take up a position on Hund Hill at 5 A. M.

6. Refugees report that General Jose Velazquez Toral is in command of the Spanish forces at Santiago.

7. Our cavalry reports that a hostile force estimated at one brigade entered Gettysburg this morning at 7:00 A. M. via the Chambersburg road.

*Par. 55-56, Signal Book, U. S. Army, 1914.

8. Mounted Scouts, Henzie Ranch, Wash.,
5 May, 1912, 9:30 A. M. No. 1.

Advance Guard Commander:

Have seen no patrols, but tracks on roads indicate that a force of the enemy consisting of infantry retreated south this morning.

Brown, Lieut.

9. Mounted Scouts, Magnolia Bluff, Wash.
5 May, 1912, 10:00 A. M., No. 2.

Advance Guard Commander:

Mounted Scout reports that he saw 5 red soldiers retreating in the direction of Interbay. Will continue my reconnaissance towards Interbay.

Brown, Lieut.

10. Mounted Scouts, Interbay, Wash.
5 May, 1912, 10:30 A. M., No. 3.

Advance Guard Commander:

A company of red infantry has just crossed the Interbay bridge and is retreating toward the Great Northern Docks.

Brown, Lieut.

Note—In the sending of messages it must be remembered that all abbreviations and conventional signals are followed by "front"; that the address of a message is considered as a sentence and is followed by three "fronts."

LESSON IX.

Learn the following abbreviations and conventional signals.

Check.....	CK front
From	FM front
Hour	HO front
Official Business.....	OB front
Signature follows.....	Sig front

Field Messages.

The term "field message" is applied to all messages sent over field lines of information, whether by buzzer, telegraph, helio, flag or messenger. When sent by electrical or visual means they should be plainly written, and, if available, on the blank forms, (Figure 1), furnished by the signal corps. The field message blank is used for all messages, both sent and received.*

Sending operator. When the sending operator receives a message for transmission, he enters at the lower left hand corner of the blank form after word "Received," the time the message was received by him for transmission; in the first square at the top of the blank form, the serial number of the message; in the second square the call letter of his own station and his personal signal; in the sixth square the check

*Par. 57, Signal Book, U. S. Arm., 1914.

or number of words in the message including the address and signature. After the message has been R'd by the receiving station, the sending operator enters in the third square, the time the message was sent, and in the fourth square he enters the call letter of the receiving station and the personal signal of the receiving operator.

All messages are given a new serial number for each day.

Receiving Operator. The receiving operator adds to the message received, the month, date, hour and year, and omits "Sig" and "At." After checking the number of words in the message, counting the address and signature, he signals "R front" to the sending station followed by the call letter of his own station and his personal signal; he then enters in the proper place, fifth square, the time the message was received.*

Transmission of Field Messages. A field message is transmitted in the following order:

1. Serial number of message.
2. Call letter of sending station.
3. Personal signal of sending operator.
4. Check or number of words in message, including address and signature.
5. "Fm"—Name of sending detachment.

* Par. 59, Signal Book, U. S. Army, 1914.

No. 5. Troop "A" 1st Cavalry.
Cemetery Ridge, Kansas.
18 Aug., 1910, 3:30 P.M. No. 3
Advance Guard Commander.

A regiment of hostile infantry is camped two miles south of Leavenworth.

Smith, Capt.

No. 6. Advance Guard, 1st Division.
Atascadero Ranch, Cal.
29 Sept., 1910, 10:45 A. M. No. 1
Commanding Officer Detachment 1st Division.
Paso Robles, Cal.

It is reported that the enemy's cavalry patrols have been seen at Santa Margaritá. His Infantry and artillery are reported at San Louis Obispo.

Bell, Major.

No. 7. Troop "D" 1st Cavalry.
Atchison, Kansas.
25 June, 1910, 11:45 A. M. No. 1.
Advance Guard Commander.

Inhabitants in and about the vicinity of Atchison are becoming very active and hostile.

Brown, Capt.

No. 8.

Mounted Scouts.

Power Station, Interbay, Wash.
5 May, 1912, 11:00 A. M. No. 4.

Advance Guard Commander:

A force of red infantry is entrenched on bluffs overlooking Great Northern Docks.

Brown, Lieut.

No. 9.

Officer's Patrol.

Black Creek Bridge.

20 July, 1912, 4:30 P. M. No. 2.

Outpost Commander.

At 4:00 P. M. a hostile patrol of 3 men crossed the Black Creek Bridge and retreated down the railroad toward Rochester.

Smith, Lieut.

No. 10.

Officer's Patrol.

Black Creek Bridge.

20 July, 1912, 4:15 P. M. No. 2.

Outpost Commander.

A track walker from Rochester reports that a regiment of red infantry has camped for the night east of Rochester, near the Scatter Creek Bridge.

Smith, Lieut.

No. 11

Troop A, 3rd Cavalry.

Aberdeen Junction, Wash.

25 July, 1912, 3:00 P. M. No. 3.

Commanding Officer 1st Brigade.

Two regiments of Blue Infantry have camped for the night at Norwalk. Hostile cavalry patrols have been seen between Elma at Satsop.

Jones, Captain.

No. 12.

Officer's Patrol, Burns House.

26 April, 1912, 10:00 A. M. No. 5.

Advance Commander.

At 9:45 a hostile cavalry patrol of three troopers crossed the road at Frenchman's going north and disappeared in the woods along Salt Creek.

Smith, Lieut.

U. S. ARMY FIELD MESSAGE

Communicated by
BUZZER, PHONE TELEGRAPH,
WIRELESS, LANTERN, HELIO,
FLAG, CYCLIST, FOOT MESSENGER,
GER. MOUNTED MESSENGER.
(Underscore means used)

No. 5

Sent by
DJO

Time
9:00

Rec'd by

Time
170B

Check

This Space for Signal Operators Only

From Headquarters 20th. Infantry

NAME OF SENDING DETACHMENT HERE

At Dupont Station, Wash.

LOCATION OF SENDING DETACHMENT HERE

Date 10 Sept. 1911 Hours 8:15 a. m. No. 7

To Major Thomas.

Spray Lake, Wash.

The machine guns have been ordered to join you at once.

Johnson.

Received _____

(PLATE 1)

LESSON X.

Training of Signalmen.

It has been found by experience that the only satisfactory way to obtain uniformity in the training of signalmen in regiments is to organize them into a signal detachment under the supervision of an officer and competent noncommissioned officers; to keep them proficient requires constant practice under conditions simulating field conditions. Signalmen may be able to communicate with one another in the same company, but when required to communicate with the signalmen of other companies they will usually be found to be deficient. Signalmen are prone to acquire peculiarities of speed and manner in the execution of signals; they invent conventional signals, abbreviations and short cuts of their own which cannot be understood by other signalmen.

Location of Signal Stations.

In the selection of signal stations two important things—visibility between stations and concealment from hostile observation—must be considered. To insure visibility between stations there must be a clear and unobstructed view between them, and the signal flags must be plainly seen on the background on which they are displayed.

Visibility—Select a station in plain view of the distant station, but avoid a location at or near camps, as the canvas tents and camp equipage produce mixed colored backgrounds, and the dust and smoke of the camp obstruct the view between stations. Avoid selecting stations on an east and west line, of the line of the apparent course of the sun, as the station in the direction of the sun would be enveloped in a haze and would be difficult to observe. Avoid placing stations with traveled roads or camps between them, as the smoke, dust, and light from the camps, and the dust or objects passing on the roads will materially interfere with the visibility of signals. As far as practicable, visibility being provided, a station should be selected so that messages may be readily taken to it. If possible, stations should be located on the crest of ridges, in tree tops, on buildings, or high altitudes to avoid the dust, smoke, haze and mirage which lies close to the ground. When high winds interfere with signaling, the station should be placed on the lee side of the hill, or sheltered by trees and brush. The line connecting stations should run north and south, or obliquely across the path of the sun. If this cannot be done, the stations lying in the path of the sun should be placed on high altitudes in order to have the sky as a background. This obviates, to some extent, the sun haze.

Having selected the position of the station the next thing is to determine the color of the background. To do this, fix the position of the flagman, then going in front of your station, observe your position and the colors around it. If the distant station is higher than your station, the background would be the color of the fields and woods behind and around your flagman. If it is on the same level, the background of your station will be the color of woods, hills, or objects directly behind the flagman. If the distant station is lower, the background of your station will be the color of the ground or objects lying behind and higher than your flagman. If your station is on the crest of a ridge or high altitude, the sky will be the background.

Having determined the color of your background the choice of your signal flag is fixed. The color of the flag must contrast as much as possible with that of your background. Upon the contrast between the flag and the background of your station depends the visibility of signals.

Use a white flag with green, dark, and earth colored backgrounds, and a red flag with sky, broken or mixed backgrounds. On account of the difficulty of correctly determining the color of the background, the better method is to let the distant station determine the color and indicate the flag to be used. In open-

ing communication, use different colored flags simultaneously, and the flag which gives the most intelligible signals should be used.

Concealment—To prevent hostile observation, stations may be placed in ravines between hills, or trees, or may be concealed by constructing screens of brush on the flanks and rear of the stations.

Practice such exercises as the following:

Exercise 1. Send out a detachment to establish a signal station and open communications with your position. The following must be considered in establishing the station: Concealment from hostile observation and a clear and unobstructed view between the stations.

Exercise 2. Having selected a position for the station have the detachment determine the color of the background and the flag to be used.

Exercise 3. Select a station where it is difficult to determine the color of the background; have the signalmen at this station use different colored flags simultaneously; the distant station will select the flag that gives the most intelligible signals.

Exercise 4. Select two stations in the path of the sun, one on the ground and the other on a high altitude and explain the difference in visibility of the flags at the two stations.

Exercise 5. Select stations on the crest of hills or ridges, tree tops and buildings, and then on low, level ground; explain the difference in visibility of the flags at these stations. Have the men determine the color of the background and the flag to be used.

Exercise 6. Send out a detachment to establish a station near some prominent landmark; have the home station find the distant stations, and open communication.

Exercise 7. Give the general direction of a station and have the home station find it. Have the distant station endeavor to attract attention by means of pocket mirrors or smoke.

(See page 75, Manual of Visual Signaling No. 6, 1910.)

Exercise 8. Send out detachments at night with lanterns to establish stations and open communications with the home station.

LESSONS IN TWO ARM SEMAPHORE SIGNALING

LESSON I.

Two arm semaphore signaling is the simplest and quickest method of sending messages, but the range at which it may be used is very limited, as compared with the single flag.

The letters of the alphabet and conventional signals are indicated by two arms or flags revolving in relative positions around a central point like the hands of a clock.

All numerals must be spelled out, or some prearranged signal may be used to indicate when a letter signal is to represent a numeral, as by crossing the two flags over the head as shown in Figure 4, to indicate the beginning of a number. The end of a number is indicated by "Interval" after which all signals stand for letters unless the signal "Numeral" is again made.

For convenience in fixing in the mind the position of the flags for each letter of the alphabet, let us imagine that we are facing a large clock; divide the clock into seven parts, at 6:00, 7:30, 9:00, 10:30, 12:00, 1:30, 3:00, and 4:30 o'clock and we have eight radial positions in which the flags are placed in making the letters of the alphabet.

The flags are moved in the same directions as the hands of a clock, and the different positions are designated as first position, second position and so on around the clock.

The first position is 6:00 o'clock, second position 7:30 o'clock, etc., as shown in figure 1.

The letters of the alphabet and conventional signals are divided into seven different sets. The easiest way to learn the alphabet is by sets and this is the method that will be pursued here.

First set:

Letters A, B, C, D, E, F, G.

Numerals 1, 2, 3, 4, 5, 6, 7.

Second set:

Letters H, I, K, L, M, N, omitting J.

Numerals 8, 9.

Third set:

Letters O, P, Q, R, S.

Fourth set:

Letters T, U, Y.

Fifth set:

Letters J, V.

Numerals, 0.

Sixth set:

Letters W, X.

Seventh set:

Letter Z.

When signaling, the sender faces towards the person with whom he wishes to communicate.

If using the semaphore machine, as on board ship, the indicator shows the side from which the signal commences.

To call a station, signal attention; raise both flags over the head and wave them between the 10:30 and 1:30 o'clock positions as shown in Figure 2. Make the signal at frequent intervals until answered.

Station called answers by signaling "attention" followed its call letter. Both stations then make "interval."

The "interval" or "end of a word" position is made by crossing the two flags downwards in front of the body, as shown in Figure 3.

When signaling words or numbers the flags are moved from position to position for each letter or numeral to the end of the word or number and then dropped to the "interval" position, 6:00 o'clock, to indicate the completion of the word or number.

When double letters occur, the flags are waved at any convenient manner after the first letter to break the signal, and brought back to position for the second letter, and not dropped to the "interval" position between the letters.

The flags must be kept separated at all positions, except at the 6:00 o'clock position, otherwise confu-

sion in the letter signaled might result. The flags will be moved from position to position in the most convenient manner.

The soldier will make better progress if he learns to receive before learning to send. He should learn the various signals by visualizing them, or by having them signaled to him. When sending he can stop to think how a letter is made, but when receiving there is no time to stop and think, he must receive the letters as they are signaled; for that reason practice in receiving should be given before practice in sending.

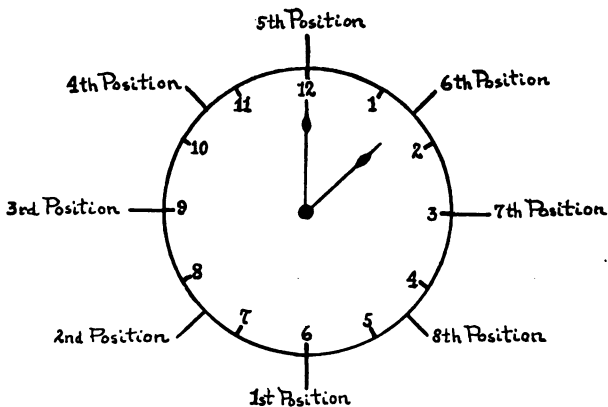
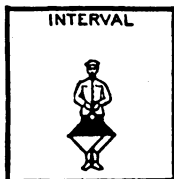
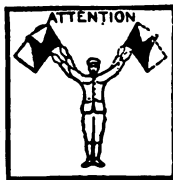


Figure 1



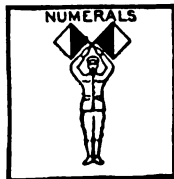
Interval or end of
word position.

Figure 2



Attention.

Figure 3



Numerals.

Figure 4

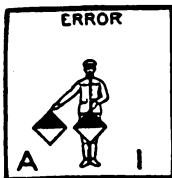
LESSON II.

First Set.

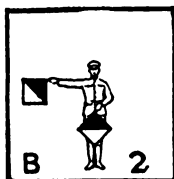
The seven letters and numbers of the first set are made with one flag. The non-signaling flag is held at the 6:00 o'clock position and the signaling flag is moved around to the other seven positions. With the letter "D" the left hand flag becomes the signaling flag and completes the circle around the face of the clock.

All positions of the flag in the succeeding lessons will be designated by the hours of the clock and should for convenience be learned in that manner. The flag in the right hand will be called the "First Flag" and the flag in the left hand the "Second Flag."

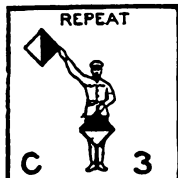
The flags must be placed exactly at the positions indicated on the clock, and must be held at the full extent of and in prolongation of the arms.



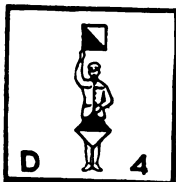
1st flag at 7:30.
2nd flag at 6:00.



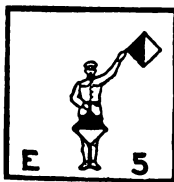
1st flag at 9:00.
2nd flag at 6:00.



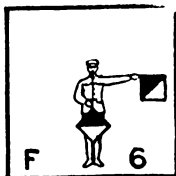
1st flag at 10:30.
2nd flag at 6:00.



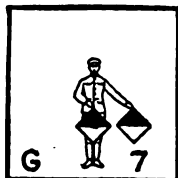
1st flag at 12:00.
2nd flag at 6:00.



1st flag at 6:00.
2nd flag at 1:30.



1st flag at 6:00.
2nd flag at 3:00.



1st flag at 6:00.
2nd flag at 4:30.

Practice sending and receiving the following words and numbers:

Abbe	Beef	abb
Abed	beg	edge
accede	cab	edged
ace	cade	efface
adage	cad	egg
add	cabbage	façade
age	cadge	face
aged	café	fad
babe	cage	fade
bag	cede	gag
baggage	dab	fee
badge	dace	feed
bee	dad	gab
bead	dead	gad
bed	deaf	gaff
be	decade	fag
bad	deface	cage
1345	1111	327,654,734
6731	7654	3441
2332	6671	5655
4444	1177	7362
5672	3114	172, 635, 443,267
7433		

Numbers begin by crossing the flags over the head as shown in Figure 4. Numbers end by the signal

“Interval” after which all signals are letters unless “Numerals” is signaled again.

*Conventional Signals.**

Repeat last word—CC “Interval” signaled twice.

Repeat last message—CCC “Interval” signaled three times.

Repeat after (word)—CC “Interval” A “Interval” (word).

End of word—“Interval” (Figure 2).

End of sentence—Chop-chop, signal.

End of message—Two successive chop-chop signals, then withdrawing the flags from view.

Error—AA “Interval” then repeat word.

To break in—Signal “Attention” (Figure 3).

To make up the chop-chop signal, both flags are placed at the right horizontal and then moved up and down in a cutting motion.

LESSON III.

Second Set.

The six letters H, I, K, L, M, and N, and the two numerals 8 and 9, of the second set, are made with two flags.

* Par. 38, Signal Book, U. S. Army, 1914.

Place the first or second flag at 7:30 o'clock and move the other flag around to the other six positions on the clock.

In making the letters H and I and the numerals 8 and 9, turn slightly to the right on the hips.

The letter J begins with the fifth position and is therefore placed with the Fifth Set. The letters of the Second Set begin with one flag at the second position on the face of the clock.



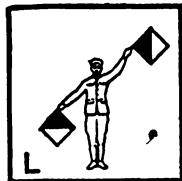
1st flag at 9:00.
2nd flag at 7:30.



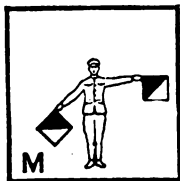
1st flag at 10:30.
2nd flag at 7:30.



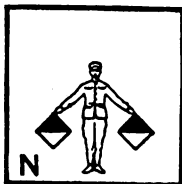
1st flag at 7:30.
2nd flag at 12:00.



1st flag at 7:30.
2nd flag at 1:30.



1st flag at 7:30.
2nd flag at 4:30.



1st flag at 7:30.
2nd flag at 3:00.

Practice receiving and sending the following words and numbers:

aback	bill	chief	flah
abeam	balance	aiming	enil
incidence	bilge	high	eniham
bank	align	nickle	elhna
cable	binnacle	hedge	klac
desk	defilade	gin	edalifne
facing	feint	fiddle	knalf
field	final	file	mialc
932	821	7689	99783
flag	game	bend	ekab
298	588	1928	98890
939	191	8297	65979
khaki	keel	lance	llac
999	549	9999	29788
landing	land-fall	leech	hcaeb
789	becalm	5968	45896
almanac	689	knee	heneb

*Conventional Signals.**

Move a little to the left.....	LL	"Interval"
Cease signaling.....	MMM	"Interval"
Signal faster.....	CK	"Interval"
Move a little down hill.....	DD	"Interval"

Abbreviations.†

ahr.	another
ck.	check
Fm.	from
Ho.	hour
Amb.	ambulance†
Bn.	battalion
Co.	company
Inf.	Infantry

1. The end of each word and abbreviation is followed by "Interval."

2. If the sender discovers that he has made an error in sending he signals "Interval" then "AA" (Error) "Interval" and repeats the word in which the error occurred.

3. Every signaller should be given a personal call letter and every station should have a call letter. (See page 8 ante, "Regimental Signalmen.")

*Par. 26, Signal Book, U. S. Army, 1914.

†Par. 17, Id.

‡See page 214, Field Service Regulations, for authorized abbreviations.

LESSON IV.

Third Set.

The five letters of the third set begin with the first flag at the third position or 9:00 o'clock, and is held in that position for all the letters in that set. The second flag is moved around to the other five positions on the clock.

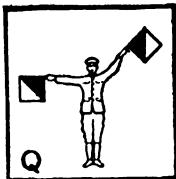
In making the letter O turn slightly to the right on the hips to make the position of the flag more distinct.



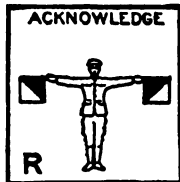
1st flag at 10:30.
2nd flag at 9:00.



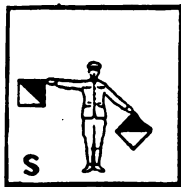
1st flag at 9:00.
2nd flag at 12:00.



1st flag at 9:00.
2nd flag at 1:30.



1st flag at 9:00.
2nd flag at 3:00.



1st flag at 9:00.
2nd flag at 4:30.

Practice receiving and sending the following words and numbers:

smokeless	sloop	splicing	gnikips
corps	seige	schrapnel	knar
ship	rolls	recoil	nonnac
schooner	anchor	rigging	reciffo
defense	sapper	sabre	gnignar
relief	remaining	rear	llehs
shackle	railroads	embargo	rodassabma
section	pension	mobile	remirp
parallel	pioneer	keelman	rednammoc
reconnaissance	ordnance	heliograph	enedecrpf
seasickness	oilskins	59483726	noissimocnon
national	medical	general	enicaf
784359	1248967	message	948765
marine-corps	corporal	948374	nosirrag
carriage	signaling	saber	moissimrep
	conventional signals		

*Conventional Signals.**

Interrogatory Signal O "Interval"
 Affirmative or yes Signal P "Interval"
 Acknowledgment or Understood. Signal R "Interval"
 Move a little to the right. Signal RR "Interval"

If the receiving station has received the message correctly he signals "R" "Interval," or signals "R" and holding the flags horizontally waves them up and down until the sender does the same.

Use of the following abbreviations is suggested:

Abbreviations.†

af. after
 be. be
 bf. before
 bn. been
 cn. can
 da. day
 govt. government
 hr. here or hear
 hv. have
 msg. message

*Par. 38, Signal Book, U. S. Army.

†Par. 17. Id.

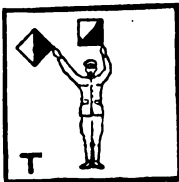
pd. paid
 r. are

LESSON V.

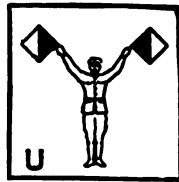
Fourth Set.

The fourth set consists of the letters T, U, and Y. The letters begin with one flag at the fifth position and is therefore placed in the "Fifth Set." The letters W and X begin with one flag at the sixth position and are placed in the "Sixth Set."

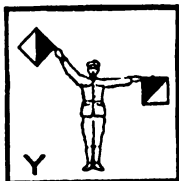
In the Fifth Set one flag is held at the 10:30 o'clock or fourth position and the other flag is moved around to the remaining four positions on the clock.



1st flag at 10:30.
 2nd flag at 12:00.



1st flag at 10:30.
 2nd flag at 1:30.



1st flag at 10:30.
2nd flag at 3:00.

Practice receiving and sending the following words and numbers:

attack	topsail	squad	kciuq
barometer	department	tonnage	resiurc
ammunition	ballast	toggle	tnardauq
departure	turret	yacht	retrauq
trunnions	yard	position	tcetihera
train	torpedo	sentry	hguorht
tiller	summary	punishment	nignrut
fleet	quartermaster	sergeant	yratilim
584736	25693478	49382756	9876584
surgeon	target	uniform	metsys
tactical	recruits	skysail	ytrebil
detachment	hydrocolledion	regiment	trellag
92837465	98765432	19711241	15493827
security	lieutenant	commissary	etulas
paymaster	nautical	lunette	tenoyab

*Conventional Signals.**

Move a little uphill. Signal "UU" "Interval"

The use of the following conventional signals is suggested.

Abbreviations.†

T and "Interval"	The
U and "Interval"	You
UR and "Interval"	Your
Det. and "Interval"	Detachment
Btry. and "Interval"	Battery
Sq. and "Interval"	Squadron
Sec. and "Interval"	Section
Co. and "Interval"	Company
Tr. and "Interval"	Troop
Hq. and "Interval"	Headquarters
Qm. and "Interval"	Quartermaster
F. Hosp. and "Interval"	Field Hospital
Sig. Corps and "Interval"	Signal Corps
Brig. and "Interval"	Brigade
F. A. and "Interval"	Field Artillery

Note—"End of word" signal follows all abbreviations so that F. Hosp. would be signaled F. "Interval" Hosp. "Interval."

*Par. 26, Signal Book, U. S. Army, 1914.

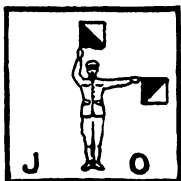
†Par. 17. Id.

For authorized abbreviations see Field Service Regulations page 214.

LESSON VI.

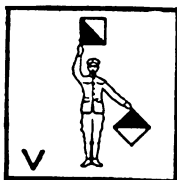
Fifth Set.

The letters J and V constitute the fifth set. The letters of this set begin with one flag held at the fifth or 12:00 o'clock position while the other flag is moved around to the remaining three positions on the clock.



1st flag at 12:00.
2nd flag at 3:00.

(Zero)



1st flag at 12:00.
2nd flag at 4:30.

Practice receiving and sending the following words and numbers:

major	cavalry	vertical	tnev
cover	wave	trajectory	ecivres
chevron	veterinarian	survey	evlav
very	traversing	navigation	edivrop
private	reserve	revetment	tnevrep

revolver	receiving	provost	evael
jeopardy	journey	Japan	liaj
velocity	vedette	vanguard	noitairav
offensive	naval	deviation	egduj
12034589	30405067	60728034	900078
jib	delivery	jetty	repinuj
June	government	January	yluj
20304050	90807060	130140	160010
joint	justify	judicious	noisivid
jurisdiction	blue jacket	volume	egareva
advance	adjutant	active	nilevaj

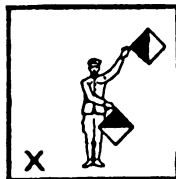
LESSON VII.

Sixth Set.

In the Sixth Set there are only two letters, W and X. The first flag is held at the sixth or 1:30 o'clock position and the other flag moved to the remaining two positions on the clock. In making W and X turn slightly to the left on the hips, to make the position of the flags more distinct.



1st flag at 1:30.
2nd flag at 3:00.



1st flag at 1:30.
2nd flag at 4:30.

Practice receiving and sending the following words:

wheel	awash	wire	egadniw
wing	wave	weather	hctaw
sweep	steward	maxim	eswah
axe	explosive	extra	rotcartxe
exchange	powder	clew	nworb
warrant	wardroom	war	nogaw
bowline	box	boatswain	cauovib
blow	without	work	xis
wish	new	hollow	tnatxes
know	explain	complex	notxes
2345	10673	210409	98007
while	exercise	exercise	syar-x
sword	windward	warm	weiv
exist	wharf	extraordinary	neetxis
yawl	crosswise	exception	noitanimaxe
answer	maximum	flow	tnemirepxe

The use of the following abbreviations is suggested.

*Abbreviations**

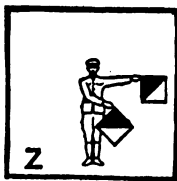
W.	with
Wrd.	word

*Par. 17, Signal Book, U. S. Army, 1914.

LESSON VIII.

Seventh Set.

The letter Z completes the seven sets which comprise the two arm semaphore code. One flag is placed at the seventh position and the other flag at the eighth position. Turn slightly to the left on the hips so as to make the position of the flags more distinct.



1st flag at 8:00.
2nd flag at 4:30.

Practice receiving and sending the following words:

muzzle	mixxen	zigzag	fuzzy
magazine	pize	zone	equalize
organization	horizontal	size	azimuth
Switzerland	bezine	advance	admiral
Maneuver	ambulance	barbette	banquette
seize	benzine	elective	compass
entanglement	eschelon	barrecade	contraband
submarine	collier	castramenta-	shelter
		tion	

rococet	casualty	requisition	percussion
zenith	zeal	zine	zodiac
zither	zouave	zepher	zebra
squadron	zero	automobile	militia
chevaux-de- frise	hazy	lozenge	equalizing
lazy	major- general	lizard	utilize
nozzle	economizing	galvanized	zoölogy
authorize	triangu- lation	gabion	haze

Note—For sentences, messages for practice and location of signal stations see Lessons in Wig-wag Signaling, Lesson X.

89087931028



B89087931028A



89087931028



b89087931028a